



PATENT  
3009-1015

**IN THE U.S. PATENT AND TRADEMARK OFFICE**

In re application of

Brian COTTRELL

Conf. 2058

Application No. 10/529,178

Group 2863

Filed March 24, 2005

Examiner S. Cherry

DIAGNOSTIC TOOL FOR AN ENERGY CONVERSION APPLIANCE

**DECLARATION UNDER RULE 132**

Assistant Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

1. I, Colin Chapman, am a citizen of the United Kingdom and reside in Plymouth, England. My background includes a BEng(Hons) degree in Electronic Engineering from Plymouth University. My work experience includes 5 years as an Engineer and a further 10 years as Engineering Manager. I am currently employed at Invensys Controls Ltd as Senior Engineering Manager.

2. I am familiar with the above-identified U.S. patent application, its prosecution before the United States Patent and Trademark Office, and the applied references of WEST et al. (U.S. Patent 5,120,214) and CARR-BRION (GB 2156520).

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3. In order to demonstrate the patentability of the present invention, I am submitting the following observations:

a) The West invention is directed solely and specifically to separately modulating the flow of air and the flow of fuel to a flame in a furnace.

West has identified that there is a linear relationship between optimum combustion conditions of that flame and the sounds generated within the flame and which have a relatively high frequency, namely a frequency greater than 10 KHz (col.8, line 67 - col.9, line 4), preferably greater than 20KHz, more preferably greater than 30KHz (col. 1, lines 9 - 14 and col.3, lines 42 - 47).

b) My understanding of West is that every effort must be made to ensure that the microphone senses only the high frequency sounds occurring within the flame, and to avoid the microphone receiving sounds from any other source.

For that reason West details specific provisions necessary to ensure that his microphone can operate effectively from a position at which it is not exposed directly to the heat of the flame and still not be exposed to extraneous sounds.

These provisions include the use of a wave guide not only to isolate the microphone from the harsh environment within the furnace but also to "focus" the microphone on the sound "...".

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within the centre of the envelope of the flame...". This is further evidenced by the acoustic dampening material that isolates the microphone from the "...spurious sounds from the walls of the furnace....".

c) I am of the considered opinion that if the microphone of West were exposed to sounds from other sources, and which I would expect to include some frequencies falling within the restricted frequency range detected by that microphone, the system of West would not function properly to provide effective and reliable modulation of the air and fuel supplies necessary for optimum combustion conditions.

That is, the signal provided by West's microphone would be detrimentally contaminated by extraneous sounds and the supplies to the flame would be incorrectly controlled.

d) The Cottrell invention of the subject patent application is directed to monitoring of two or more operational events one of which is related to combustion and the other to a mechanical or electro-mechanical event. It is not concerned with controlling combustion conditions within a flame.

For that monitoring purpose it is, in my opinion, essential that the sound receiving transducer should be able to monitor a wide range of frequencies.

Thus, whilst in West it is necessary to detect only frequencies greater than 10 KHz, in the Cottrell invention that limitation would be wholly inappropriate. It is necessary for Cottrell's

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sound receiving transducers to detect for analysis a wide range of frequencies including frequencies below 10KHz.

e) Having regard to my foregoing observations I am of the considered opinion that:-

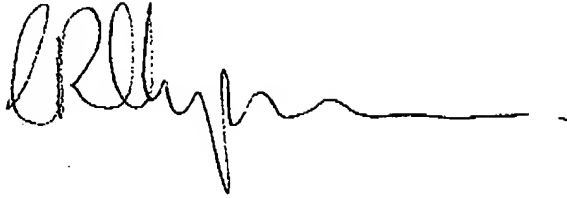
(i) the microphone of West is not intended to, and would not, detect any sounds from sources other than the flame, and

(ii) if the microphone did detect sounds from other sources, because it is specific to detecting frequencies greater than 10KHz it would not be effective for reliably distinguishing between the performances of two or more different types of operational events in the manner required by Cottrell.

4. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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Date August 7, 2008

A handwritten signature in black ink, appearing to read 'Colin Chapman', with a long horizontal flourish extending to the right.

Colin Chapman